

**REMARKS**

Claims 11, 22, 23, 38 and 39 have been amended, claim 21 has been cancelled without prejudice or disclaimer and claim 40 has been added. Proper support for newly added claim 40 can be found in the specification at least at paragraph [0040]. Proper support for the amendment to claims 11, 38 and 39 is found in the specification, at least at paragraphs [0069], [0070], [0075], [0082] and [0083]. Claims 11-20, 22-24 and 38-40 are pending and under consideration. Claims 11, 38, 39 and 40 are the independent claims. No new matter is presented in this Amendment.

Claim 40 recites a method of preparing a positive active material including a core and a surface-treatment layer, for a rechargeable lithium battery, the method comprising, amongst other novel features, coating and drying the lithiated compound simultaneously. As will be discussed below, neither of the references teaches or suggests this novel feature. Furthermore, by drying and coating the core simultaneously a more uniform coating is achieved, resulting in improved cycle life characteristics and lowered internal resistance.

**REJECTIONS UNDER 35 U.S.C. §103:**

Claims 11-20, 38 and 39 are rejected under 35 U.S.C. §103(a) as being unpatentable over JP 09-171813 (hereinafter JP '813).

Applicants respectfully traverse this rejection for at least the following reasons.

Regarding the rejection of independent claim 11, it is noted that claim 11 recites a method of preparing a positive active material for a rechargeable lithium battery comprising, amongst other novel features, drying the coated lithiated compound at a temperature of approximately 60°C to 100°C forming a surface treatment layer on the coated lithiated compound without further heat-treating the dried coated lithiated compound, wherein the coating and drying of the lithiated compound is performed by injecting the lithiated compound and the organic solution or the aqueous solution of coating material source into a mixer and continuously increasing the temperature within the mixer.

JP '813 discloses an electrolyte battery including a positive electrode. The positive active material is formed by mixing cobalt and lithium carbonates. Thereafter, the positive active material,  $\text{LiCoO}_2$  is heat-treated at 900°C for 5 hours under ambient atmosphere. Next, an aluminum hydroxide composite and the powder of the  $\text{LiCoO}_2$  were dried at 120°C or more for 2 hours (paragraphs [0035] through [0038]).

Accordingly, JP '813 discloses a method of preparing a positive active material by drying a lithiated compound at 120°C or higher for 2 hours. The Examiner states that one artisan would be motivated to manipulate the drying temperature of the JP '813 so as to fall within the claimed range. MPEP 2144.05(III), recites that "[t]he law is replete with cases in which the difference between the claimed invention and the prior art is some range or other variable within the claims. . . . In such a situation, the applicant must show that the particular range is critical, generally by showing that the claimed range achieves unexpected results relative to the prior art range.' *In re Woodruff*, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir. 1990)." Additionally, in making a rejection based on the obviousness of a claimed feature, the Examiner needs to account for evidence in embodiments and experiments set forth in the specification that show the non-obvious nature of the feature. *In Re Glaug*, 62 USPQ2d 1151 (Fed. Cir. 2002).

In the instant case, by drying the coated lithiated compound at a temperature of approximately 60°C to 100°C forming a surface treatment layer and by the coating and drying of the lithiated compound, unexpected results are achieved as illustrated in Tables 1 and 2 of the specification. Furthermore, by coating and drying the core simultaneously, a more uniform coating of the compound and distribution of the coating material is attained. Therefore, this uniform coating results in improved cycle life characteristics and lowered internal resistance.

Accordingly, JP '813 fails to teach or suggest such novel features recited in independent claim 11. Furthermore, JP '813 does not teach or suggest that the lithiated compound is coated and dried by injecting the lithiated compound and the organic solution or the aqueous solution of coating material source into a mixer, and continuously increasing the temperature within the mixer, as recited in independent claim 11.

Accordingly, Applicants respectfully assert that the rejection of claim 11 under 35 U.S.C. § 103(a) should be withdrawn because JP '813 fails to teach or suggest each feature of independent claim 11, as amended.

Furthermore, Applicants respectfully assert that the rejection of dependent claims 12-20 under 35 U.S.C. § 103(a) should be withdrawn at least because of their dependence from claim 11 and the reasons set forth above, and because the dependent claims include additional features which are not taught or suggested by the prior art. Therefore, it is respectfully submitted that claims 12-20 also distinguish over the prior art.

Regarding the rejection of independent claim 38, it is noted that claim 38 recites a method of preparing a positive active material including a core and a surface-treatment layer, for

a rechargeable lithium battery, the method comprising, amongst other novel features, coating the core and drying the coated core at a temperature of approximately 60°C to 100°C, without further heat-treating the core, forming the surface treatment layer on the core, wherein the coating and drying of the lithiated compound is performed by injecting the lithiated compound and the organic solution or the aqueous solution of coating material source into a mixer and continuously increasing the temperature within the mixer.

As noted above, JP '813 discloses a method of preparing a positive active material by drying a lithiated compound at 120°C or higher for 2 hours. However, as also noted above, by coating and drying the core at a temperature of approximately 60°C to 100°C unexpected results are achieved.

Furthermore, JP '813 does not teach or suggest that the lithiated compound is coated and dried by injecting the lithiated compound and the organic solution or the aqueous solution of coating material source into a mixer, and continuously increasing the temperature within the mixer, as recited in independent claim 38.

Accordingly, Applicants respectfully assert that the rejection of claim 38 under 35 U.S.C. § 103(a) should be withdrawn because JP '813 fails to teach or suggest each feature of independent claim 38, as amended.

Regarding the rejection of independent claim 39, it is noted that claim 39 recites a method of preparing a positive active material for a rechargeable lithium battery comprising, amongst other novel features, coating a core having at least one lithiated compound with an organic solution of coating material source or an aqueous solution of coating material source; and drying the core at a temperature of approximately 60°C to 100°C without further heat-treating the core, forming a surface treatment layer on the core, wherein the coating and drying of the lithiated compound is performed by injecting the lithiated compound and the organic solution or the aqueous solution of coating material source into a mixer and continuously increasing the temperature within the mixer.

As noted above, by coating and drying the core at a temperature of approximately 60°C to 100°C, unexpected results are obtained resulting in improved cycle life characteristics and lowered internal resistance. As noted above, JP '813 discloses a method of preparing a positive active material by drying a lithiated compound at 120°C or higher for 2 hours, which is a range outside of the one recited in the independent claim. Therefore, JP '813 fails to teach or suggest the novel features of the independent claim.

Furthermore, JP '813 does not teach or suggest that the lithiated compound is coated and dried by injecting the lithiated compound and the organic solution or the aqueous solution of coating material source into a mixer, and continuously increasing the temperature within the mixer, as recited in independent claim 39.

Accordingly, Applicants respectfully assert that the rejection of claim 39 under 35 U.S.C. § 103(a) should be withdrawn because JP '813 fails to teach or suggest each feature of independent claim 39, as amended.

Claims 21-24 are rejected under 35 U.S.C. §103(a) as being unpatentable over by JP '813 as applied to claims 11-20, and further in view of Maegawa et al. U.S. Patent No. 6,383,235 (hereinafter Maegawa).

Applicants respectfully traverse this rejection for at least the following reasons.

Regarding the rejection of claim 21, it is noted that claim 21 has been cancelled without prejudice or disclaimer.

Regarding the rejection of claims 22-24, it is noted that these claims depend from independent claim 11 and as noted above, JP '813 fails to teach or suggest the novel features recited in independent claim 11.

Maegawa discloses a process for preparing cathode materials having a homogenous composition. To achieve this, aqueous solutions of each of a lithium salt, a transition metal salt, and a complexing agent are prepared and mixed in a stoichiometric ratio of a cathode material, and therefrom water is removed by spray-drying to form a precursor which is then heat-treated (abstract and column 4, lines 58-65).

In other words, Maegawa discloses a coating process along the lines of the prior art, where a lithiated material or compound is prepared by mixing various elements, removing solvents from the mixed compound, drying the mixed compound, and thereafter, heat-treating the mixed compound (column 8, lines 1-8 and FIG. 4 of the present application).

Accordingly, Maegawa fails to cure the deficiencies of JP '813.

Furthermore, it is noted there is no motivation or suggestion to combine JP '813 and Maegawa, since Maegawa teaches a method of preparing a positive active material along the lines of the prior art which requires a heat-treating step. Contrary to Maegawa, independent claim 11 recites drying the coated lithiated compound at a temperature of approximately 60°C to 100°C, without further heat-treating the coated lithiated compound.

Although the Office Action relies on Maegawa for a teaching of a mixing and drying of the material, it is noted that Maegawa also discloses heat-treating the mixed compound. Therefore, although Maegawa teaches drying and mixing, Maegawa also teaches heat-treating. Therefore, there would be no motivation to combine Maegawa with JP '813 since Maegawa is along the lines of the prior art.

Accordingly, Applicants respectfully submit that the only motivation to combine JP '813 and Maegawa in the Office Action would have been found in Applicants own application. However, MPEP § 2141 instructs that "the references must be viewed without the benefit of impermissible hindsight vision afforded by the claimed invention." Furthermore, MPEP 2143 instructs that "the teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in applicant's disclosure."

Accordingly, Applicants respectfully assert that the rejection of claims 22-24 under 35 U.S.C. § 103(a) should be withdrawn because neither JP '813 nor Maegawa, whether taken singly or combined, teach or suggest each feature of independent claim 11, from which claims 22-24 depend, and because the dependent claims include additional features which are not taught or suggested by the prior art. Therefore, it is respectfully submitted that claims 22-24 also distinguish over the prior art.

#### **DOUBLE PATENTING:**

Claims 11-24, 38, and 39 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over the claims of U.S. Patent Nos. 6,753,111; 6,797,435 and 6,846,592.

Since claims 11-24, 38 and 39 of the instant application have not yet been indicated as allowable, it is believed that any submission of a Terminal Disclaimer would be premature (see MPEP 804).

Claims 11-20, 24, 38, and 39 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over the claims of co-pending Application No. 10/944,892.

Since claims 11-20, 24, 38 and 39 of the instant application have not yet been indicated as allowable, it is believed that any submission of a Terminal Disclaimer would be premature (see MPEP 804).

**CONCLUSION:**

There being no further outstanding objections or rejections, it is submitted that the application is in condition for allowance. An early action to that effect is courteously solicited.

Finally, if there are any formal matters remaining after this response, the Examiner is requested to telephone the undersigned to attend to these matters.

If there are any additional fees associated with filing of this Amendment, please charge the same to our Deposit Account No. 503333.

Respectfully submitted,

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